

DEPARTMENT OF AND HUMAN SETTLEMENTS

**GUIDELINES FOR HOUSE AND SITE
INSPECTIONS AT LOW COST HOUSING
PROJECTS IN THE NORTH WEST
PROVINCE**

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EDICT OF GOVERNMENT

In order to promote public education and public safety, equal justice for all, a better informed citizenry, the rule of law, world trade, and world peace, this policy guideline is hereby made available on a noncommercial basis, as it is the right of all humans to know and speak the laws that govern them.

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ABBREVIATIONS

ABBREVIATION	FULL DESCRIPTION
BC	Before Christ
BQIH	Building Quality Inspection Index for Houses
CIDB	Construction Industry Development Board
CONQUAS	Construction Quality Assessment System
COP	Code of Practice
CSIR	Council for Scientific and Industrial Research
DPC	Damp-Proof Course
EIA	Environment Impact Assessment
GPS	Global Positioning System
HOD	Head of Department
HSS	Housing Subsidy System
IRC	Inherent Risk Class
kg	Kilogram
l	Litre
m	Meter
Max	Maximum
MEC	Member of the Executive Council
Min	Minimum
mm	Millimeter
MPa	Mega Pascal
N/A	Not applicable
NHBRC	National Home Builders Registration Council
NRCS	National Regulator for Compulsory Specifications
NWHS	North West Department of Human Settlements
PVC	Poly vinyl chloride

SABS	South African Bureau of Standards
SANAS	South African National Accreditation System
SANS	South African National Standards

DEFINITIONS

Agrément Certificate refers to a certificate that confirms fitness-for-purpose of a non-standardised system, element or component and the conditions pertaining thereto (or both) issued by the Board of Agrément.

Balustrade refers to the railing made from vertical molded shaft, square, or lathe-turned form found in stairways, parapets, and other architectural features.

Board of Agrément South Africa refers to a body operating under the delegation of authority of the Minister of Public Works.

Brick force refers to the steel reinforcement that strengthens a wall and is placed in the cement between every course of bricks to make them stronger and stop them from cracking. Brick force is used in every course of the foundation and every course above lintel height.

Building refers to construction works that have the provision of shelter for its occupants or contents as one of its main purposes, usually partially or totally enclosed and designed to stand permanently in one place.

Certificate of compliance refers to a certificate with a unique number obtainable from an approved scheme issued by a certifier in terms of such a scheme.

Certifier refers to a member of a Council approved certification scheme who is in good standing and who is employed by the certification body appointed by the home builder to issue certificates or certificates of compliance with the NHBRC Technical Requirements.

Collapsible soils refers to soils that undergo sudden decrease in volume when trigger events occur of which trigger events may include wetting under-load, stress changes or even stresses (loading) due to earth tremors where underlying dolomitic or limestone bedrocks are, which can easily be eroded by acid water, and can cause sudden collapse (sinkholes) of the soil at the surface. In other words, it is soils with a collapsible soil structure (open textured with a low density) that when subjected to a combination of an applied load and an increase in soil moisture content, will experience sudden or rapid settlement.

Commercial standards refers to standards that are developed by industry and government where there is a high frequency of recurring needs for certain materials and/or performance requirements and these entail a complete description of the materials, quality, finishing, testing methods and standards, dimensions, composition, et cetera, and forms part of mass production systems and provides a measurement for quality standards.

Compaction of foundation – tamping, rodding, forking refers to the operation of consolidating freshly placed concrete or other repair materials by repeated blows or penetrations with a tamping tool.

Compliance method refers to the application of design and construction rules or compliance with referenced standards in order to achieve performance requirements.

Component refers to a product manufactured as a distinct unit to serve a specific function or functions.

Competent Person refers to a person who is qualified by virtue of his/her education, training, experience and contextual knowledge to make a determination regarding the

performance of a building or part thereof in relation to a functional regulation or to undertake such duties as may be assigned to him/her.

Compressible soils refers to soil that experience gradual settlement as its volume decreases when subjected to an applied load.

Contaminated land refers to any land condition, by reason of substances in, or under the land, which presents an unacceptable risk to health and safety of occupants of housing units constructed on such land. Known contaminations in South Africa includes amongst others, asbestos, radon and uranium and appropriate testing should be conducted to determine the future safety of proposed human settlement developments on contaminated land.

Concrete apron refers to a slab of material, usually concrete or asphalt that is placed in front of the garage door and may continue around the perimeter of the building. It is often used to create a smooth transition between different grades of concrete or between concrete and asphalt. In addition, this feature can provide the benefit of draining water away from the home's foundation.

Damp-proof course refers to a layer of waterproof material in the wall of a building near the ground, to prevent rising damp.

Days refers to calendar days, not working days.

Deemed-to-satisfy refers to the mandatory requirement, the compliance with which ensures compliance with a functional regulation.

Deflection refers to the movement under actions of a defined point in a structure, in a defined direction.

Delegation refers in terms of the Housing Act, Act 107 of 1997, Part 3, Section 7, Sub-sections (1), (2), (3) and (5):

- (1) Every provincial government, through its MEC, must after consultation with the provincial organizations representing municipalities as contemplated in section 136(a) of the Constitution, do everything in its power to promote and facilitate the provision of adequate housing in its province within the framework of national housing policy.
- (2) For the purposes of sub-section (1) every provincial government must through its MEC:
 - (a) determine provincial policy in respect of housing development;
 - (b) promote the adoption of provincial legislation to ensure effective housing delivery;
 - (c) take all reasonable and necessary steps to support and strengthen the capacity of municipalities to effectively exercise their powers and perform their duties in respect of housing development;
 - (d) co-ordinate housing development in the province;
 - (e) take all reasonable and necessary steps to support municipalities in the exercise of their powers and the performance of their duties in respect of housing development;
 - (f) when a municipality cannot or does not perform a duty imposed by this Act, intervene by taking any appropriate steps in accordance with section 139 of the Constitution to ensure the performance of such duty; and
 - (g) prepare and maintain a multi-year plan in respect of the execution of the province of every national housing programme and every provincial housing programme, which is consistent with national housing policy and section 3(2)(b), in accordance with the guidelines that the Minister approves for the financing of such a plan with money from the Fund.
- (3) An MEC must:

- (a) administer every national housing programme and every provincial housing programme which is consistent with national housing policy in section 3(2)(b), and for this purpose may, in accordance with that programme and the prescripts contained in the Code, approve:
 - (I) any projects in respect thereof; and
 - (II) the financing thereof out of money paid into the provincial housing development fund as contemplated in section 12(2);
 - (b) determine provincial housing development priorities in accordance with national housing policy;
 - (c) apply procurement policy in respect of housing development determined by the Minister in terms of section 3(2)(c); and
 - (d) administer the assets contemplated in section 14.
- (4) The MEC may, subject to conditions he or she may deem appropriate in any instance:
- (a) delegate any power conferred on him or her by this Act; or
 - (b) assign any duty imposed upon him or her by this Act,

to an officer or employee of the department responsible for the administration of housing matters in a province, either in her or her personal capacity or by virtue of the rank he or she holds or the post he or she occupies: Provided that the delegation or assignment does not prevent the person who made the delegation or assignment from exercising that power or performing that duty to himself or herself.

Developer refers to the organ/institution planning and implementing human settlement developments. In the case of the North West Province, the Department of Human Settlements remains the Developer, unless a local municipality have been assigned/accredited under the Housing Act, Act 107 of 1997, and the Municipal Accreditation Framework.

Design specifications refers to a set of detailed specifications for non-standardised materials (such as for innovative or alternative methods or products) to meet specific design requirements and in the South African context, such requires Agrément Certification.

Development risk refers to the likelihood and extent of loss of life, loss or damage to property or financial loss.

Dolomite area designations refers to the precautionary measures that must be applied as follows:

Dolomitic Area Designations	Description	Single Storey Masonry House Construction Type
D1	No site and service precautionary measures required	As for site class R, H – H3, C – C2, and S – S2
D2	General site and service precautionary measures required	As for site class R, H – H3, C – C2, and S – S2
D3	Precautionary measures in addition to D2 are required	Special foundations e.g. fill mattresses, rafts spanning near surface pinnacles
D4	Unsuitable for housing developments	-

Dolomite land refers to land underlain by dolomite or limestone residuum or bedrock (or both), within the Malmani Subgroup and Campbell Rand Subgroup, typically at depths of no more than:

- a) 60m in areas underlain by limestone;
- b) 60m in areas where no de-watering has taken place and the local authority has jurisdiction, is monitoring and has control over groundwater levels in the areas under consideration; or
- c) 100m in areas where de-watering has taken place or where the local authority has no jurisdiction or control over groundwater levels.

Drainage installation refers to an assembly of pipes, fittings and apparatus such as septic tanks, conservancy tanks and fresh drains, which are used to collect, convey, store or treat the discharge from receptacles associated with a home to which water is supplied and from which waste water or foul water is discharged.

Dwelling unit refers to a single unit providing complete, independent living facilities for one or more persons including permanent provisions for living, sleeping, eating, cooking and sanitation which may be separated from or linked horizontally or vertically to other units.

Element refers to a major functional part of a building.

Engineering drawings refers to design specifications that specify shapes, dimensions, spatial relationships and technical details of a project which requires explicit descriptive instructions and details.

Erodible soils refers to soils that are affected by flowing water, i.e. water moving over or through the soil, will tend to physically remove particles from the exposed surface. The soil erodibility is an estimate of the ability of soils to resist erosion, based on the physical characteristics of each soil type. Soils with faster infiltration rates (velocity or speed at which water enters into the soil), higher levels of organic matter and improved soil structure, have a greater resistance to erosion. Sand, sandy loam and loam textured soils tend to be less erodible than silt, very fine sand, and certain clay textured soils.

Expansive soils refers to clay soils that change in volume in a seasonal cycle as the moisture content of the soil varies with the seasons and shrinkage occurs mainly in the dry season and swelling during the wet season and therefore damage to structures occur, especially when the potential expansiveness of the soil has not been properly taken into account during the design of foundations. In other words, it is fine grained soil whose

clay mineralogy is such that it changes in volume to varying degrees in response to changes in moisture content, i.e. the soil may increase in volume (heave or swell) upon wetting and decrease in volume (shrink) upon drying out.

Extra-ordinary human settlement development conditions refers to site characteristics which necessitate that some measures over and above the "norm" are required to ensure satisfactory housing outcomes and therefore require intensive precautionary measures to ensure a durable product with investment value. Extra-ordinary human settlement development conditions relate to climatic, topographic (natural ground slope of a site) and geotechnical (inherent geology) conditions.

Factual data refers to materials, statistics, and properties that can be seen, measured or identified by means of accepted or standardised criteria, classifications and tests.

Fibre-cement sheets refers to a type of fibre cement which is a composite material made of cement reinforced with cellulose fibres.

Fire resistance refers to the shortest period for which an element or component complies with requirements for stability, integrity and insulation when tested in accordance with SANS 10177-2 *Fire testing of materials, components and elements used in buildings – Part 2: Fire resistance tests for building elements*.

Fitness for purpose refers to the ability of a system, element or component to be consistently developed, manufactured, applied and installed such that it fulfills its intended purpose.

Foundation refers to the foundational structure with the primary function to provide adequate support to the structures which they carry, which implies sufficient load bearing capacity to safely resist the effects of the various combinations of permanent and

transient loads transmitted to the founding strata, without excessive deformation, which could otherwise compromise the integrity of the structure or impair its use. The safe or allowable bearing pressure is therefore a function of the ultimate load bearing capacity of the ground at the founding level and the load-settlement characteristics of the underlying layers.

Founding horizon refers to a stratum of soil that exhibits similar geotechnical and engineering properties and characteristics and supports a structure.

Functional regulation refers to legislation that sets out qualitative terms what is required of a building or building element or building component in respect of a particular characteristic without specifying the method of construction, dimensions or material to be used.

Function and fit specifications refers to specifications used to describe what a product/service is required to do and the desired performance is described in detail, including functions to be performed, its relationship to other components, and design outcomes required, e.g. deemed-to-satisfy standards in the application of national building regulations.

Gable refers to the generally triangular portion of a wall between the edges of intersecting roof pitches. The shape of the gable and how it is detailed depends on the structural system used, which reflects climate, material availability, and aesthetic concerns.

Geotechnical conditions refers to geologically related conditions (soil, groundwater, etc.) that can influence the quality of the housing product if precautionary measures are not implemented.

Geo-hazards refers to:

- a) a geological state or an incipient geological condition that has the potential to develop further into a situation leading to harm, damage or uncontrolled risk;
- b) phenomena that are related to geological and environmental conditions and involve long-term and short-term geological processes which range in magnitude from relatively small to large scale features and may affect the local and regional socio-economy; and
- c) areas characterized by potential life-threatening geological conditions in South Africa, including dolomite land, under-mined areas, areas of potential slope stability problems and areas prone to severe seismicity and flood-line areas.

Geotechnical site investigation refers to the process of evaluating the geotechnical character to a site in the context of existing or proposed works or land usage, which may include on or more of the following:

- a) evaluation of the geology and hydrogeology of the site;
- b) examination of existing geotechnical information pertaining to the site;
- c) excavating or boring in soil or rock and the systematic description of the soil and rock profiles;
- d) determine the depth of any fill that might be present;
- e) *in situ* assessment of geotechnical properties or materials;
- f) recovery of samples of soil or rock for examination, identification, recording, testing or display;
- g) testing of soil or rock samples to quantify properties relevant to the purpose of the investigation;
- h) evaluation of geotechnical properties of tested soils; and
- i) reporting the results.

Geotechnical solutions refers to a solution designed to reduce total ground movements to levels which can be tolerated by the surface beds, if any, and structural system.

Global positioning system refers to a device capable of receiving time and special information from a constellation of geostationary satellites and translating these degrees of latitude and longitude and elevation with respect to a universal coordinate system.

Greenfield site refers to an undeveloped site earmarked for a new human settlement development project.

Ground movement refers to the displacement of the founding stratum in any direction by influences not solely dependent on the actions applied by the structure of a home.

Hazard refers to the inherently dangerous quality of a substance, procedure or an event.

Hazard rating refers to the number of sinkhole and subsidence occurrences per hectare over a 200 year period.

Heave/shrinkage refers to the anticipated (vertical) surface movement produced by an expansive soil horizon caused by seasonal cyclic fluctuation in moisture content within the horizon.

Home refers to a meaning assigned in the Housing Consumer Protection Measures Act, Act 95 of 1998:

a) excluding:

- a. any building which is constructed with less than two thirds of the floor area designed for residential purposes;

- b. homes that are co-owned in terms of the Share Blocks Control Act, Act 59 of 1980 or Property Time-Sharing Control Act, Act 75 of 1983;
 - c. any home forming part of an informal settlement;
 - d. any temporary building as contemplated in the National Building Regulations issued in terms of the National Building Regulations and Building Standards Act, Act 103 of 1977; and
 - e. a shack or caravan.
- b) including:
- a. a unit to be occupied for residential purposes as contemplated in the definition of "social housing" in Section 1 of the Social Housing Act, Act 16 of 2008;
 - b. a residential section registered in terms of the Sectional Titles Act, Act 95 of 1986, and any common building;
 - c. a unit as contemplated in the Housing Development Schemes for Retired Persons Act, Act 65 of 1988;
 - d. a unit forming part of a housing programme contemplated in the National Housing Code issued in terms of the Housing Act, Act 107 of 1997;
 - e. the private drainage system from the home up to the municipal connection or up to and including a conservancy or septic tank;
 - f. water services from the point of supply to the point of discharge at fixtures and appliances;
 - g. any ancillary buildings such as storerooms, covered walkways, garages, and common facilities;
 - h. any retaining wall necessary to ensure the structural integrity of the home; and
 - i. any adjacent building or wall on common property that has the potential to damage the home should it for any reason collapse.

Housing consumer refers to a person who is in the process of acquiring or has acquired a home and includes such person's successor in title.

Housing development is defined in terms of Housing Act, Act 107 of 1997, as the establishment and maintenance of habitable, stable and sustainable public and private residential environments to ensure viable households and communities in areas allowing convenient access to economic opportunities, and to health, education and social amenities in which all citizens and permanent residents of the Republic will, on a progressive basis, have access to permanent residential structures with secure tenure, ensuring internal and external privacy and providing adequate protection against the elements, and potable water, adequate sanitary facilities and domestic energy supply.

Infrastructure delivery refers to the combination of all planning, technical, administrative and managerial actions associated with the construction, supply, renovation, rehabilitation, alteration, maintenance, operation or disposal of infrastructure.

Infrastructure procurement refers to the procurement of goods and services including any combination thereof associated with acquisition, renovation, rehabilitation, alteration, maintenance, operation or disposal of infrastructure.

Inherent risk refers to the potential for an event (sinkhole or subsidence) to develop in a particular ground profile on dolomitic land.

Inherent risk class refers to a classification system whereby a site is characterized in terms of eight standard inherent hazard classes, demoting the likelihood of an event (sinkhole or subsidence) occurring, as well as its prescribed size (diameter). The inherent hazard risk class is based on two parameters, namely the inherent susceptibility to sinkhole formation and the maximum size of surface manifestation of a sinkhole as follows:

Inherent Hazard Class	Inherent susceptibility of sinkhole formation	Maximum size of surface manifestation of a sinkhole (m)			
		<2	2 – 5	5 – 15	>15
1	Low (up to 1 event per hectare per 200 years)	*	*	*	*
2	Medium (between 1 and 10 events per 200 years)	*			
3			*		
4				*	
5	High (greater than 10 events per 200 years)	*			
6			*		
7				*	
8					*

Permissible human settlement developments, based on the above inherent hazard risk classes of a site, the anticipated size of a sinkhole, the density of homes and the precautionary measures required to support development for homes to be constructed in dolomitic area designations of D2 and D3 are:

Inherent susceptibility characterization of the site	Maximum diameter of surface manifestation of sinkhole (m)			
	Small (less than 2m diameter)	Medium (2-5m diameter)	Large (5-15m diameter)	Very large (greater than 15m diameter)
Low – up to and including 1 event per hectare per 200 years	Up to 300 attached homes per hectare in buildings exceeding 3 storeys with D2 precautions and FPI.			Homes not permitted
	More than 120 attached homes per hectare in buildings not exceeding 3 storeys with D3 precautions and FPI			
	Up to 120 attached homes per hectare in buildings not exceeding 3 storeys with D2 precautions and FPI.			
	Detached home on own site or an effective site having an area not less than 150m ² with D2 precautions.			
	Up to 160 attached homes per hectare in buildings exceeding 3 storeys with D3 precautions and FPI.			
	More than 120 attached homes per hectare in buildings not exceeding 3	None.		

Medium – between 1 and 10 events per hectare per 200 years	storeys with D3 precautions and FPI.		
	Up to 120 attached homes per hectare in buildings not exceeding 3 storeys with D2 precautions and FPI.	Up to 80 attached homes per hectare in buildings not exceeding 3 storeys with D3 precautions and FPI.	
	Detached home on own site or an effective site having an area greater than 150m ² with D3 precautions.	Detached home on own site or an effective site having and not less than 300m ² with D3 precautions.	
High – greater than 10 events anticipated per hectare per 200 years	Up to 160 attached homes per hectare in buildings exceeding 3 storeys with D3 precautions and FPI.	None	Homes not permitted
	Up to 80 attached homes per hectare in buildings not exceeding 3 storeys with D3 precautions and FPI.		
	Detached home on own site or an effective site having an area not less than 1000m ² with D3 precautions and FPI.		

In situ refers to the original place.

Inspection refers to the general inspection by a competent person of a system or a measure or installation of a building, or part thereof, at such intervals as might be necessary in accordance with accepted professional practice to enable such competent person to be satisfied that the design assumptions are valid, the design is being correctly interpreted and the work is being executed generally in accordance with the designs, appropriate construction techniques and good practice.

Inspection stages in North West Department of Human Settlements refers to inspections conducted at the following construction stages:

- a) Foundation
 - a. Earthworks
 - b. Excavation
 - c. Steel/Pre-pour
 - d. Certification
- b) Wall plate
 - a. Door/window height and placement
 - b. Wall plate with specific attention to roof ties and brick force in all courses from windows to wall places
- c) Roof
- d) Completion, hand-over and occupation
- e) Post occupation for completion of snags

Land slip refers to the sudden movement of soil/rock slope, or gradual creep of a slope (typically with both a vertical and horizontal movement component) over a period of time.

Listed competent person refers to a competent person whose credentials are accepted by the Council of Geoscience and/or the National Home Builders Registration Council, and is admitted to the Council's list of competent persons.

Material-and-Method of Manufacture design specifications refers to very prescriptive design specifications whereby prospective suppliers are given precise instructions in the use and processing of materials, which is often very costly as it requires very detailed preparations in the use and processing of documents and detailed inspections to ensure compliance with requirements, which may apply to for example specific foundations to be designed by an Engineer for specific areas underlain with geotechnical development conditions.

Megapascal refers to the measure of the compressive strength of concrete.

Municipality means a municipality as contemplated in Section 2 of the Local Government Municipal System Act, Act 32 of 2000.

National Department refers to the National Department of Human Settlements.

National Home Builders Registration Council is established in terms of the Housing Consumers Protection Measures Act, Act 95 of 1998 and the objectives of the Council includes to:

- a) represent the interests of housing consumers by providing warranty protection against defects in new homes;
- b) regulate the home building industry;
- c) provide protection to housing consumers in respect of failure of home builders to comply with their obligations in terms of the Act;
- d) establish and promote ethical standards in the home building industry;
- e) improve structural quality in the interests of housing consumers and the home building industry;
- f) promote housing consumer rights and provide housing consumer information;
- g) communicate with and assist home builders to register in terms of the Act; and
- h) assist home builders, through training and inspection, to achieve and maintain satisfactory technical standards of home building.

Opinion refers to conclusions or recommendations derived by a Competent Person from consideration of factual and interpretative data and from the exercise of judgment.

Precautionary measures refers to preventative measures required to ensure a durable product with investment value.

Prescriptive regulation refers to a regulation which describes in some detail an operation to be performed, or the dimensions of a building, building element or building component and the materials and methods of construction to be used in such a building, building element, or building component.

Procurement refers to procedures that must be fair, equitable and transparent for the acquisition of housing goods and services. However, municipalities/Provincial Department may employ current legislation authorizing the waiver of tender procedures and the introduction of replacement procedures appropriate for use in emergency housing situations. Proactive procurement procedures must be considered and can include annual contracts and the establishment of panels of suitable contractors and consultants.

Provincial Department refers to the North West Provincial Department of Human Settlements.

Rational assessment refers to the assessment by a competent person of the adequacy of the performance of a solution in relation to requirements including, as necessary, a process of reasoning, calculation and consideration of accepted analytical principles, based on a combination of deductions from available information, research and data, appropriate testing and service experience.

Reliability refers to the ability of a structure or a structural element to fulfill the specified requirements, including the design working life, for which it has been designed.

Risk management refers to the identification, assessment and prioritization of risks followed by coordinated and economical application or strategy of resources to minimize, monitor and control the probability and/or impact of unfortunate events or to maximize the realization of opportunities.

Risk management strategy refers to an approach or set of principles according to which plans are built to reduce risk.

Settlement refers to the vertical movement within a structure due to the distribution or re-distribution of loading and stresses within the various elements of construction or the downward movement of a structure under applied load.

Site class refers to areas which have been designated as having common foundation and engineering statistics, as follows:

Residential Site Class Designations	Typical Founding Material	Character of Founding Material	Single Storey Masonry House Construction Type
R	Rocks	Stable	Normal
H	Clays, silty clays, clayey silts and sandy clays	Expansive soils	Normal
H1			Modified normal / soil raft
H2			Stiffened or cellular raft / piled or split construction / soil raft
H3			Stiffened or cellular raft / piled construction / soil raft
C	Silty sands, sands, sandy and gravel soils	Compressible and potentially collapsible soils	Normal
C1			Modified normal / compaction of <i>in situ</i> soils below individual footings / deep strips foundations / soil raft
C2			Stiffened strip footings / stiffened or cellular raft / deep strip foundations / compaction of <i>in situ</i> soils below individual footings / piled or pier foundations / soil raft
P	Contaminated soils, controlled fill, Dolomitic areas, landslip, landfill, marshy areas, mine waste fill, mining subsidence, reclaimed areas, uncontrolled fill, very soft silts, silty clays	Variable	Variable
S		Compressible soils	Normal

S1	Clayey silts, clayey sands of low plasticity, sands, sandy and gravelly soils		Modified normal / compaction of <i>in situ</i> soil below individual footings / deep strip foundations / soil raft
S2			Stiffened or cellular raft / deep strip foundations / compaction of <i>in situ</i> soils below individual footings / piled or pier foundations / soil raft

Soil creep refers to the slow downward progression of rock and soil down a low grade slope and it can also refer to slow deformation of such materials as a result of prolonged pressure and stress.

Soil compaction refers to the process of removing water and air to create a solid foundation. Soil compaction improves the strength of the soil and reduces its compressibility. The soil's permeability is also lowered as it is more difficult for water to flow through it when the spaced between the particles are decreased.

South African National Accreditation System refers to a single National Accreditation Body that gives formal recognition that Laboratories, Certification Bodies, Inspection Bodies, Proficiency Testing Scheme Providers, and Good Laboratory Practice test facilities are competent to carry out specific tasks.

Standard refers to a document that provides for common and repeated use, rules, guidelines or characteristics for products, services, or processes and production methods, including terminology, symbols, packaging, marking or labelling requirements as they apply to a product, service, process or production method.

Structural system refers to the system of constructional elements and components of a home which is provided to resist the loads acting upon it and to transfer such load to the ground upon which the home is founded.

Subsidence refers to the downward movement of a foundation caused by loss of support beneath the foundation.

Technical Services Advisor refers to an employee of NWHS who is at a level of Assistant Director or Deputy Director or Director responsible for Technical Services in terms of Housing Planning/Technical Services.

Topographical conditions refers to the natural ground slope of the site that can influence the quality of the housing product if precautionary measures are not implemented.

Total quality refers to a function comprising of an entire collection of activities through which fitness-for-use is achieved, which covers every process, job and person involved in achieving fitness-for-use total quality and thereby involving the entire organization in the value chain integrated in such manner that enables effective utilization of resources thus enabling the most economic level at which full beneficiary satisfaction can be achieved, driven by the principle of continuous improvement in every activity, including decision making and behaviour by employees which requires the optimization of systems with all stakeholders, including suppliers, subcontractors, employees, markets, communities, regulators, i.e. the entire supply chain.

Variability refers to the change in the properties or conditions of common materials or horizons in the soil profile with time or over a short lateral and/or vertical distance.

Variation calculator refers to an electronic calculator that has been developed for use when calculating the adjustment of the subsidy amount. The formulas used in the calculator are based on the extraordinary development conditions and the subsidy amount available during a specific financial year. Following the adjustment of the subsidy amount, an updated calculator is made available by the National Department of Human Settlements.

To facilitate the evaluation of project applications, the Variation Manual is supported by an automatic variation amount calculator. This calculator operates through the software programme Microsoft Word Excel and is available from the National Department of Human Settlement. The calculator will annually adjusted by the Department in line with the building cost index. It is important to note that although the calculator can be used to determine variation amounts required for the adjustment of the project cost at project application stages, the actual variation amount must be determined based on professional assessment of the extraordinary development conditions and the costing of the precautionary measures designed by the professionals. A geotechnical calculator was developed for the Department, in line with the National Department's variation calculator, in 2004, by Sonderland and Schutte Consulting Engineers, to be used by the Department for the calculation of geotechnical variations, which remains in use in the Department until such time deemed otherwise by the Accounting Officer of the Department.

Workmanlike manner refers to an industry standard that refers to the desired and acceptable standard of quality of work and materials on a construction project, in other words, it refers the way work is customarily done by contractors, and any contractor that fails to perform in a workmanlike manner, the proper measure of damages is the cost to repair the damage to the conditions contemplated by the parties at the time of the contract.

1. INTRODUCTION

It is a legislative mandate of the Department of Human Settlements to ensure that beneficiaries of low cost housing opportunities are provided with high quality housing typologies that provides an investment value for beneficiaries in the long term. There is a vast array of legislative and policy prescripts prescribing how quality low cost housing should be provided throughout the country. The how-part of providing low cost housing also involves the uniform application of site and house inspections during the various stages of construction. Uniform application of inspections of various stages ensures that low cost houses are of high quality and provides long-term investment value.

Quality is the buzz-word going hand-in-hand with uniform application of norms and standards in construction of which quality is verified through proper inspections by Housing Inspector, thereby enforcing compliance and conformity to legislative and policy frameworks prescribing the level of quality. Quality management in housing construction is not a new concept, the Code of Hammurabi, 2000 BC, stated that "if a builder has built a house for a man, and his work is not strong enough, and the house falls and kills the householder, that builder shall be slain". Around 1450 BC quality control of component parts was undertaken by Egyptians and Aztecs by inspecting and measuring the squareness of building blocks.

The National Home Builders Registration Council aspires that home builders achieve quality to protect home owners and has over the years identified various quality concerns in house construction in general, of which quality concerns includes amongst others the use of poor quality bricks, insufficient cement in mortar mix, poor plaster applications to exterior walls, poor storm water management, structural failure due to poor founding conditions, incorrect use of brick force, incorrect or no brick bonding, vertical cracks in plaster because of poor quality sand and mix, poor workmanship, structural defects, no on-site quality control, and sagging and leaking roofs.

In addition reports by the National Home Builders Registration Council on home construction concerns, there are many challenges that the North West Department of Human Settlements had experienced with Contractors over the years, for example, general poor workmanship and the “cutting of corners”; the continued use of inappropriate materials and technologies; not using or adhering to technical norms, standards and building regulations; the lack of appropriate attention given to structural detailing such as connections; not observing recommendations by Competent Persons in the case of areas where geotechnical extra-ordinary development conditions have been identified and confirmed; widespread inspections conducted “remotely” without even having been physically at the site to confirm milestones as per building regulations and building designs and specifications; lack of monitoring and evaluation the quality of house and site inspections; and capacity shortages to ensure that proper house and site inspections takes place procedurally. Therefore, in order to eliminate or minimize these challenges, the introduction of this Guideline to assist the North West Department of Human Settlements in its effort to ensure structural integrity according to technical norms and standards.

The Housing Act, Act 107 of 1997, and further set out in the Housing Code, 2009, mandates that construction stages must be confirmed through certification of completed works for signing-off and payment purposes. It is mandated that certification must be accompanied by progress reports as per set milestones, of which milestones includes *inter alia* earthworks, i.e. site preparations and excavations, foundations and floor slabs, wall plates, roofs, finishes, completion and post completion audits or inspection. Relevant and applicable legislative and policy frameworks further mandates that all site and house inspection should also be subjected to inspections by the Local Municipality and the National Home Builders Registration Council, besides the Inspectors of the North West Department of Human Settlements. The main purpose of inspections therefore is to establish control and audit mechanisms to manage technical risks during milestone and

construction stages to ensure quality low cost housing opportunities are delivered and overall compliance will all relevant and applicable legislative and policy frameworks.

This Guideline should not be read and implemented in isolation from all the relevant, applicable, listed (and non-listed), and referred legislation in this Guidelines. Compliance to the prescripts approved in this Guideline in conjunction with all applicable and relevant legislative and policy frameworks, cannot be enough ever-emphasized.

2. PURPOSE OF THE GUIDELINE

The purpose of this Guideline is to ensure and achieve uniformity and standardization in the inspection of houses and sites under construction; to establish and promote ethical and technical standards application; to ensure adherence to technical norms and standards by registered home builders; to minimize the risk to the housing consumer of having to receive housing units of sub-standard quality; and in the long term to ensure the delivery of the highest quality housing products and opportunities that are acceptable to beneficiaries and that will ensure durable products with investment value, even if the houses were built under the "low cost" principle. The ultimate purpose of this Guideline is to encourage and instill the culture of "doing things correctly and right from the beginning with honesty and integrity".

The risk of not complying with this Guideline in conjunction with relevant legislative and policy frameworks ultimately bears negative consequences of development and a legal risk that can range from being accountable to justify actions or decisions made incorrectly and therefore knowingly accepting legal responsibility for loss of life. Therefore, the risks needs to be managed and the responsibility thereof lies with the accountable officials.

3. SCOPE OF APPLICATION

This policy applies to all subsidized low cost human settlement development projects and low cost housing subsidy options, inclusive of projects applying innovative building technologies, and irrespective the housing programme that is being implemented.

4. OBJECTIVES OF THE GUIDELINE

The main objective of this Guideline is to ensure that correct, standardized and uniform site and house inspections take places at all times according to technical and building norms and standards as outlined by relevant and applicable legislative and policy frameworks. To comply with this objective:

- 4.1. ensure the housing development project meets the structural, safety, fire protection, energy saving and accessibility requirements and integrity;
- 4.2. assure compliance with required building and technical regulations and standards;
- 4.3. achieve legal certification for every milestone or construction stage;
- 4.4. reduce technical risks and prevent construction errors;
- 4.5. control budgets;
- 4.6. keep housing construction project schedules on schedule with comprehensive inspection at every stage of the project; and
- 4.7. minimize the risks to the housing consumer and the North West Department of Human Settlements.

5. GUIDELINE PRINCIPLES

This Guideline is underpinned by the following principles:

- 5.1. creating healthy and safe human settlement environments;
- 5.2. creating houses that are safe and healthy for human consumption;
- 5.3. creating houses with long term value for money benefit for beneficiaries of low cost housing;
- 5.4. creating an enabling environment where applicable legislation, rules and regulations are observed and implemented to ensure health and safety of beneficiaries of housing programmes; and
- 5.5. creating a culture of "doing things right from the beginning" with honesty, integrity and transparency.

6. LEGISLATIVE MANDATE

The following legislative, policy and strategic frameworks are the primary enabling legislation insofar as it pertains to the standard and uniform application and procedures of site and house inspections during construction works, and should therefore not be read and applied in isolation, but as part of an array of primary and secondary enabling legislative, policy and strategic frameworks, and those legislative, policy and strategic frameworks that are not mentioned herein, should be consulted, if needed:

6.1. Building Regulations and Building Standards Act, Act 103 of 1977

The Building Regulations and Building Standards Act, Act 103 of 1977, provides for the promotion of uniformity in law relating to the construction of buildings and prescribing of building standards. The Regulations consists of the following parts, ALL equally applicable to human settlement developments for government: Part A: Administration; Part B: Structural Design; Part C: Dimensions; Part D: Public Safety; Part E: Demolition Work; Part F: Site Operations; Part G: Excavations; Part H: Foundations; Part J: Floors; Part K: Walls; Part L: Roofs; Part M: Stairways; Part N: Glazing; Part O: Lighting and Ventilation; Part P: Drainage; Part Q: Non-waterborne means of Sanitary Disposal; Part R: Storm water Disposal; Part S: Facilities for Disabled Persons; Part T: Fire Protection; Part U: Refuse Disposal; Part V: Space Heating; Part W: Fire Installations. It is the Inspector's job to enforce building codes as outlined in the Building Regulations and Building Standards Act, Act 103 of 1997, of which the Inspectors' must have appropriate experience in the construction of various types of buildings.

The Building Regulations and Building Standards Act, Act 103 of 1977, provides for the promotion of uniformity in the law relating to the construction of buildings in the areas of jurisdiction of Local Authorities and prescribing building standards. It is further concerned with the protection of property and general safety, health and convenience of the public in relation to the building of homes, the design and construction of homes which are not harmful to the health or well-being of users and occupiers, and ensuring that certain solutions that are adopted for homes contribute positively to environmental sustainability. South African National Standards (SANS) establishes the level of performance (quantitative requirements) and "deemed-to-satisfy" provisions and the means by which functional requirements established in the regulations may be satisfied by application of a set of rules, national assessments or rational designs by a Competent Person and Agrément certification. All applicable SANS regulations should be consulted in conjunction with this policy.

The Building Regulations and Building Standards Act, Act 103 of 1977, do not place any specific obligations on persons responsible for constructing a building; however, courts have accepted that a building contractor in general does have a legal duty to both the building owner and to third parties to refrain from building something which is manifestly unsafe, failing which they expose themselves to delict (wrongful and blameworthy conduct which causes harm to a person) and negligence and the consequences thereof.

6.2. Constitution of the Republic of South Africa, Act 108 of 1996

The Constitution of the Republic of South Africa, Act 108 of 1996, in Section 10, prescribes that everyone has an inherent right to dignity and the right to have their dignity respected and protected, which is critical in the implementation of housing programme. Essential for NWHS to observe is Section 26 which prescribes that everyone has a right to have access to adequate housing and that the state (NWHS) must take reasonable legislative measures within its available resources to achieve this progressive right.

Emphasis is on placed on adequate housing as adequate housing is inclusive of housing that is safe, meaning that all reasonable precaution should be taken where human settlements are developed such that safety of beneficiaries are guaranteed, as it also states in Section 24(a) that *everyone has the right to an environment that is not harmful to their health or well-being* whereas Section 152(1)(d) states that *the objective of local government is to promote health and safety of its inhabitants*.

6.3. Construction Industry Development Board Act, Act 38 of 2000

The Construction Industry Development Board, Act 38 of 2000, provides for the establishment of the Construction Industry Development Board (CIDB) to implement and integrated strategy for the reconstruction, growth and development of the construction industry and creates a register of contractors that are linked to a best practice contractor

recognition scheme and a register of projects linked to best practice project assessment scheme.

The Construction Industry Development Board, Act 38 of 2000, prohibits contractors from undertaking, carrying out or completing any construction works or portions thereof in respect of a public sector contract, unless the contractor is registered with and is in possession of a valid registration issued by the CIDB; and further requires every organ of state to apply the register of contractors to its procurement processes and as such may not award a construction works contract to an unregistered contractor or to a registered contractor who does not possess the required contractor grading designation. The prescripts of the Construction Industry Development Board, Act 38 of 2000, is therefore very important in that government must ensure that contractors are registered and graded insofar it pertains to ensure adherence to technical norms and standards and ensuring that contractor "do things right from the beginning".

The Construction Industry Development Board launched in 1989 the Construction Quality Assessment System (CONQUAS) with the main purpose to introduce a standard quality assessment system for construction projects; to make quality assessment objectives; and to enable the assessments to be carried out in a systematic manner within reasonable cost and time.

6.4. Consumer Protection Act, Act 86 of 2008

The Consumer Protection Act, Act 86 of 2008, provides for the protection of the interests of consumers and for that purpose to make provision for the establishment of consumer councils and other authorities for the settlement of consumers' disputes and for matters connected therewith. The Consumer Protection Act, Act 86 of 2008, has an impact particular on the design of homes as it gives every consumer a right to receive goods (tangible objects) that are not only reasonable suitable for purposes of which they are

generally intended, but also comply with any applicable standards as set out under the Standards Act, Act 8 of 2008.

6.5. Explosives Act, Act 26 of 1956, as amended to Act 15 of 2003

The Explosives Act, Act 26 of 1956, as amended to Act 15 of 2003, provides for the rules and regulations regarding explosives-handling, basic blaster requirements, blasting permits, responsibilities of blasters, allowable types of blasting, and blasting site inspections. It is very important to note that no person shall use any blasting material unless in possession of a permit issued by or under the authority of an inspector or under the immediate and constant supervision of a person who is in possession of such a permit. The important of the Explosives Act, Act 26 of 1956, as amended to Act 15 of 2003, relates to hard rock excavations and boulder blasting for construction purposes. It is important for blasters on human settlement development construction sites to follow blaster responsibilities and perform only the work outlined in a permit to the latter as set out in The Explosives Act, Act 26 of 1956, as amended to Act 15 of 2003.

6.6. Housing Act, Act 107 of 1997

The Housing Act, Act 107 of 1997, is the primary piece of legislation for the housing mandate in South Africa and it legally entrenches policy principles outlined in the 1994 White Paper on Housing which provides for sustainable housing development processes, laying down general principles for housing development in all spheres of government, defining functions of national, provincial and local governments in relations to housing development; and it lays a foundation for the financing of national housing programmes.

In terms of the Housing Act, Act 107 of 1997, Section 1 (vi) housing development can be seen as the *establishment and maintenance of habitable, stable and sustainable public and private residential environments to ensure viable households and communities in*

areas allowing convenient access to economic opportunities, and to health, educational and social amenities in which all citizens and permanent residents of the country will on a progressive basis have access to permanent residential structures with secure tenure, ensuring internal and external privacy and providing adequate protection against all the elements and potable water, adequate sanitary facilities and domestic energy supply.

Part 3, Section 7, Sub-sections (1), (2), (3) and (5) delegate provincial policy making functions in terms of human settlement development in a Province to the Member of the Executive Council (MEC) for Human Settlements. It further provides for the Housing Code, 2009, setting out principles, guidelines, and norms and standards which apply to government's various housing assistance programmes that were introduced since 1994 and which were updated on a regular basis.

6.7. Housing Code, 2009

The National Housing Code, 2009, sets out the underlying principles, guidelines, and norms and standards which apply to government's various housing assistance programmes that were introduced since 1994. The main purpose is to provide an easy to understand overview of the various housing subsidy instruments available to assist low income households to access adequate housing.

The Minister of Human Settlements introduced National Norms and Standards for the construction of stand-alone houses, and all houses constructed through the application of the National Housing Programmes as contained in the Housing Code, 2009, must at least comply with these norms and standards. These norms and standards applies together with the National Building Regulations and Building Standards Act, Act 103 of 1977 and the home building prescripts of the National Home Builders Registration Council. The National Norms and Standards does not only provide requirements for floor area and room layouts, but also provides minimum technical specifications, including

environmentally efficient design proposals, of which technical provisions include minimum levels of service for water, sanitation, roads, storm water and street lighting.

The minimum technical specification for stand-alone houses are based on the provisions of the Home Building Manual as issued by the NHBRC, and applicable parts of the SANS 10400 on the assumption that favourable founding conditions exist, i.e. site class designation is H, S, R or C, the topography is level, the connection between the house and a municipal water supply or sewer is not more than 10 meters and the site does not fall within the Southern Cape Coastal Condensation Area.

6.8. Housing Consumer Protection Measures Act, Act 95 of 1998

The Housing Consumer Protection Measures Act, Act 95 of 1998, requires the National Home Building Registration Council (NHBRC) to publish a Home Building Manual, which contains the Technical Requirements (2014) prescribed by the Minister and guidelines established by the NHBRC to satisfy such requirements. The NHBRC Home Building Manual, amongst others, describes the roles and responsibilities of different role players assigned in terms of the primary pieces of legislation governing the design and construction of homes, i.e. the National Building Regulations and Building Standards Act, Act 103 of 1977; the Housing Consumer Protection Measures Act, Act 95 of 1998; and the Occupational Health and Safety Act, Act 85 of 1993.

The NHBRC Technical Requirements includes standards in line with the prescripts of the National Standards Act, Act 8 of 2008, i.e. performance requirements, evaluation, geotechnical investigations to determine foundation parameters, development of land underlain by dolomite, greenfield developments, approved certification schemes, and a Council list of Competent Persons. The NHBRC, in conjunction with the Council for Scientific Research (CSIR) developed the Building Quality Inspection Index for Houses (BQIH) which is a system similar to the Construction Quality Assessment System

(CONQUAS) launched by the Construction Industry Development Board, which was developed so that the home building industry has a standard quality assessment system to achieve measured constructed works against workmanship standards and specifications.

Besides the NHBRC providing technical norms and standards, it also represent the interest of housing consumers by providing warranty protection against defect in newly built homes; it regulates the home building industry in its entirety; it establishing and promotes ethical standards in the home building industry; it seeks to improves structural quality in the interest of housing consumers and the home building industry; and promotes home consumers rights.

The Housing Consumer Protection Measures Act, Act 95 of 1998, in Section 10, requires that home builders construct homes in a workmanlike manner which are fit for habitation and comply with the NHBRC Technical Requirements, and registered home builders rectify at their own cost major structural defects in a home cause by the non-compliance with the NHBRC Technical Requirements and occurring within a stipulated period; and on this basis, the Housing Consumer Protection Measures Act, Act 95 of 1998, does not exempt any person from any provision of the National Building Regulations and Building Standards Act, Act 103 of 1997.

6.12. National Treasury Standard for Infrastructure Procurement and Delivery Management, 2016

The National Treasury Standard for Infrastructure Procurement and Delivery Management Policy Framework, 2016, establishes a control framework for the planning, design and execution of infrastructure projects and infrastructure procurement as it relates to institutional arrangements, demand management, acquisition management, contract management, logistics management, disposal management, risk management,

as well as providing minimum requirements for infrastructure procurement. It of great importance that the Department adheres to these guidelines in all instances of procurement that is related to infrastructure management.

6.13. National Regulator for Compulsory Specifications Act, Act 5 of 2008

The National Regulator for Compulsory Specifications Act, Act 5 of 2008, enables the National Regulator for Compulsory Specifications (NRCS) to issue compulsory specifications, especially technical requirements that require conformity of a product or service to health, safety or environmental protection requirements of a standard, or specific provision/s of a standard.

According to the National Regulator for Compulsory Specifications Act, Act 5 of 2008, no person may import, sell, or use a commodity, product or service to which a compulsory specification applies unless such specification and, if applicable, marked in the prescribed manner with a distinctive mark which constitutes a declaration of conformity to requirements. The Compulsory List includes the following products which may be incorporated into a home, i.e. safety glass and other glazing materials (VC9003); hot water storage tanks for domestic use (VC9006); cement (VC9085); preservative treated timber (VC9092); circuit breakers (VC8036); earth leakage protection units (VC8035); starters for tubular florescent lamps (VC8039); and incandescent lamps (VC8043).

6.14. Occupational Health and Safety Act, Act 85 of 1993

This Occupational Health and Safety Act, Act 85 of 1993, provides for the health and safety of persons at work and for the health and safety of persons in connection with the use of plant and machinery and the protection of persons other than persons at work against hazards to health and safety arising out of or in connection with the activities of persons at work.

The Construction Regulations, 2014, as issued under the Occupational Health and Safety Act, Act 85 of 1993, are applicable to all persons involved in construction works and cover requirements for applications for construction work permits, notifications for construction works, duties of a client, duties of a designer, duties of a principal contractor and a contractor, management and supervision of construction work, risk assessment for construction work, fall protection, structures, temporary works, excavations, demolition work, tunneling, scaffolding, suspended platforms, rope access work, material hoists, bulk mixing plants, explosive actuated fastening device, cranes, construction vehicles, electrical installation and machinery on construction sites, use and temporary storage of flammable liquids on construction sites, water environments, housekeeping and general safeguarding of construction sites, construction employee facilities, construction health and safety technical committees, approved inspection authorities and offences and penalties.

6.15. Standards Act, Act 8 of 2008

The Standards Act, Act 8 of 2008, provides for the development, promotion and maintenance of standardization and quality in connection and rendering of related conformity assessment services to ensure provision of an internationally recognized standardization system that continue to support the needs of South African enterprises. The South African Bureau of Standards (SABS) is a statutory body that was established in terms of the this Act as the national standardization institution of South Africa which is mandated to develop, promote and maintain South African national standards, promote quality in connection with commodities, products and services, and render conformity assessment services and assist in matter connected therewith.

It becomes necessary to differentiate between the SABS and the Board of Agrément South Africa, of which the latter is an independent body under a ministerial delegation of authority from the Minister of Public Works. Agrément South Africa assesses and certifies

fitness for purposes of systems, elements and components intended for use in construction of buildings and infrastructure which fall outside the scope of existing standards established by the SABS. Fitness for purpose in this context means the ability of the system, element or component to be consistently developed, manufactured, applied and installed such that it fulfills its intended purposes.

7. ROLES AND RESPONSIBILITIES

7.1. National Department of Human Settlements

- 7.1.1. The National Department of Human Settlements sets national policy in terms of technical requirements, norms and standards, and publish subsidy quanta with applicable variations under the authority of the Minister for Human Settlements on a regular basis.

7.2. North West Provincial Department of Human Settlements

- 7.2.1. The North West Department of Human Settlements builds homes which are in accordance with NHBRC's Home Building Manual and the National Technical Norms and Standards (Housing Code, 2009), fit for habitation, constructed in a workmanlike manner and in accordance with the provisions of the National Building Regulations and Building Standards Act, Act 103 of 1977, and complies with the NHBRC's Code of Conduct for Home Builders.
- 7.2.2. The North West Department of Human Settlements appoints Housing Inspectors who undertakes inspections to confirm compliance with the requirements of the all relevant and applicable legislative frameworks during construction milestone stages.

- 7.2.3. The basic roles and responsibilities of various levels of Housing Inspectors in the North West Department of Human Settlements are dependent on the level of the Housing Inspectors in the construction and project management value chain and is guided by their respective job descriptions.
- 7.2.4. Site meetings and technical site meetings must be facilitated by the North West Department of Human Settlements and all records, i.e. invitations, agenda, minutes and attendance registers, must be kept and submitted with every inspection stage.
- 7.2.5. Inspectors must notify Local Municipalities' Building Inspectors at least two days before the inspection, so that the Local Municipalities' Building Inspectors can be present during every inspection. All documentation of these notices and attendance registers must be kept in the master project file.
- 7.2.6. Every inspection at every inspection stage must be substantiated with applicable inspection checklists, reports and pictures.
- 7.2.7. The North West Department of Human Settlements process claims only on receipt of all required documentation and certificates and inspection reports, deviation will be entertained.
- 7.2.8. The North West Department of Human Settlements will not process any claim without receipt of copies from the Local Municipality that Building Plans for each house on every site is paid for in full as confirmation of paid-for Building Plans will assist beneficiaries in future if they wish to

extend the housing units in order to obtain easy-approval for house-alterations as the original plan will then be on file at the Local Municipality.

- 7.2.9. Competent Persons (registered in terms of the Engineering Professions of South Africa Act, Act 46 of 2000 or the National Scientific Professions Act, Act 106 of 1993), in conjunction with the North West Department of Human Settlements Technical Advisor, perform duties and inspections relating to the determination of site designations and dolomite area designations and confirming compliance with the NHBRC's technical requirements and outlined in the North West Department of Human Settlements Policy on Geotechnical Investigations in respect of Extra-ordinary Human Settlement Conditions and Applicable Variations, 2018.
- 7.2.10. The North West Department of Human Settlements Technical Advisors, in line with the North West Department of Human Settlements Policy on Geotechnical Investigations in respect of Extra-ordinary Human Settlement Conditions and Applicable Variations, 2018, should conduct regular on site visits during implementation of human settlement projects where geotechnical conditions were confirmed through geotechnical site investigations, to ensure that recommendations made in the report are adhered to and implemented to the latter.
- 7.2.11. District Coordinators must facilitate monthly meetings between the North West Department of Human Settlements, the respective Local Municipality and the respective Contractor to present project progress, challenges and plans of action to mitigate challenges.

7.3. Local Municipalities

- 7.3.1. Local Municipalities must appoint Building Control Officers/Building Inspectors/Housing Inspectors and delegate necessary authority to such Officers in a prescribed manner.
- 7.3.2. Local Municipalities must inspect all construction milestones/stages.
- 7.3.3. Local Municipalities must issue a certificate of occupancy for a completed building within fourteen (14) days of receipt of a written request from the owner/developer of such for a certificate, provided it is satisfied with the building that has been constructed according to requirements of the National Building Regulations and Building Standards Act, Act 103 of 1977, and the conditions of approval.

8. DELIVERABLES OF THE POLICY

The inspection stages in North West Department of Human Settlements refers to inspections conducted at the following construction stages that must be controlled through proper and thorough inspections:

Foundation	Wall plate	Roof	Completion	Post occupancy
<ul style="list-style-type: none"> • Earthworks and preparation of site • Excavation • Steel/Pre-pour • Certification 	<ul style="list-style-type: none"> • Door/window height and placement • Wall plate with specific attention to roof ties and brick force in all courses from windows to wall places 	<ul style="list-style-type: none"> • Roof 	<ul style="list-style-type: none"> • Completion, hand-over and occupation 	<ul style="list-style-type: none"> • Post occupation for completion of snags

SECTION 1: FOUNDATION

It is extremely important to point out that foundation work is usually part of the construction of structures which is the most uncertain and prone to risk, and which is the most important part of the housing structure; hence the utmost importance and focus on inspection of foundation works; not de-emphasizing the importance of the other construction stages. The sources of risk include factors, which affect the safety of work during construction and the utility of the structure on completion because inadequate data or inaccurate information and data was obtained from geotechnical site investigations, inadequate or inaccurate variable conditions encountered at the anticipated founding levels, difficulties experienced in the access and drainage and potential inundation in water environments, potential of collapse of excavation sites, especially in the presence of groundwater, and/or inadequate lateral support of excavations, which can lead to settlement damage of adjacent services or structures. Unreliable foundation data and information can result in possible delays and additional costs in the rectification, potential claims for delays and in some cases, foundation failure.

8.1. Earthworks and preparation of site

The following minimum inspection must be conducted and confirmed as it pertains to earthworks and the preparation of the site:

- 8.1.1. the area was properly cleared of all plant matter, tree stumps, timber, any other cellulose material, debris, refuse, any material contaminated with faecal matter;

- 8.1.2. site pegs are clearly exposed and protected and levelled; and

- 8.1.3. drainage provision must be made to direct water away from the site or that a storm water drain must be built to dispose of it, i.e. the finished ground levels must direct water away from the building or site.

8.2. Excavations for foundations

The following minimum inspection must be conducted and confirmed as it pertains to excavations for foundations:

- 8.2.1. the excavation must be deep enough as per the design or must have been taken down to firm natural/solid ground;
- 8.2.2. the bottom of the excavation in the ground, other than rock, is horizontal and level;
- 8.2.3. the bottom of the excavation is 300 millimeter or more below the level of the adjoining finished ground, final ground level;
- 8.2.4. regular checks on the trench widths, trench lengths and diagonal access external corners by using diagonal and 3.4.5. methods to check accuracy of setting out and measurements; and

8.3. Steel/Pre-pour

The following minimum inspection must be conducted and confirmed as it pertains to steel/pre-pour:

- 8.3.1. Before the concrete is poured, the following must be checked:

- 8.3.1.1. level of formwork;
- 8.3.1.2. thickness of the concrete slab or raft foundation;
- 8.3.1.3. measurements of the foundation/floor slab;
- 8.3.1.4. steel mesh and additional steel that is used conforms to the specifications and has been placed correctly as per project specifications and separated from the soil;
- 8.3.1.5. where site conditions necessitates, polyolefin under-slab membranes were used according to specifications; and
- 8.3.1.6. the concrete was placed as soon as the excavations were completed, inspected and signed-off by the Housing Inspector.

8.3.2. While the concrete is poured, the following must be checked:

- 8.3.2.1. the compressive strength must be not less than 25 MPa at twenty-eight (28) days – in case of using a “ready-mix” the compressive strength of the concrete will be checked by means of test cubes at a laboratory, which is also applicable to when the concrete is produced manually *in situ* and Housing Inspector must request the contractor to take such test cubes while the concrete is being poured and the mix proportions must be provided by the Engineer after he/she has examined/tested the quality of the sand and stone, and therefore the mix proportions may vary.

8.3.2.2. concreting was carried out as far practicable in one continuous operation; and

8.3.2.3. the concrete was compacted by mechanical vibrations or by means of tamping, spading, rodding or forking in such a manner that the concrete was thoroughly worked against the formwork and around the reinforcement and other embedded items without it having been displaced and thereby confirming that the concrete is free from honeycombing and planes of weakness, and to verify that the concrete is fully compacted, air bubbles will cease to rise to the surface in the vicinity of the vibrator – it must be emphasized that inadequate compaction can seriously affect the quality of the concrete.

8.3.3. After the concrete was poured, the following must be checked:

8.3.3.1. the finishing of the surface of the floor slab;

8.3.3.2. exposed surfaces of concrete must have been brought up to place, uniform surface with suitable screed boards;

8.3.3.3. the finished concrete must have a smooth, neat, even and uniform finish free from any honeycombing; and

8.3.3.4. at a minimum, a wooden float finish must have been achieved and the slab must be edged to give a rounded edge at the doors and end of aprons.

8.3.4. For curing and protection, the following must be checked:

- 8.3.4.1. within the first three (3) days, and five (5) days during cold weather, after the initial set, the concrete was protected from contamination and loss of moisture, in order to verify that the required compressive strength was achieved; and
 - 8.3.4.2. check the method of curing that was used, i.e. by covering the concrete with mats made of moisture-retaining material and by keeping the covering continuously wet, or by continuously spraying the exposed surfaced with water, or by covering the concrete with waterproof-sheeting.
- 8.3.5. The concrete slabs must have been positioned to allow for further extensions in the future.
- 8.3.6. Additional verification in terms of strip footing foundation:
- 8.3.6.1. the minimum width of the strip foundation must be specified by the Engineer;
 - 8.3.6.2. the minimum thickness must be 200 mm except for the case of bearing onto solid rock where the thickness shall be sufficient to achieve a level surface;
 - 8.3.6.3. the concrete that was used must be of the following grades or better, i.e. unreinforced Grade 10, or reinforced Grade 25; and
 - 8.3.6.4. reinforcement was placed centrally within the thickness of the footings with a minimum cover side of 50 mm.

8.3.7. Additional verification in terms of slab-on-the-ground foundation:

- 8.3.7.1. all measurements must be checked before concreting the foundation as well as the thickness of the floor slab and the level of the prepared site before the laying of the mesh;
- 8.3.7.2. the placement of members were placed in accordance with the methods of curing outlined in **8.3.4.2.** and that the polyolefin membranes were placed beneath the slab-on-the-ground foundation, irrespective of the site and ground condition – the sheeting must have been placed beneath the slab and the beam thickenings to that the bottom surface is entirely underlain;
- 8.3.7.3. the lapping of membranes at joints must not be less than 200 mm;
- 8.3.7.4. to ensure no displacement takes place, check that the right steel mesh was used and the reinforcement of the central and edge beams have been positions as shown on the drawings;
- 8.3.7.5. reinforcement was placed centrally within the thickness of the footings with a minimum cover side of 50 mm and check the slicing and lapping of the reinforcements of the project specifications; and
- 8.3.7.6. the concrete that was used must be of Grade 25 or better.

8.4. Certification

- 8.4.1. The Engineer's certification is compulsory to guarantee quality.

SECTION 2: WALL PLATE

In terms of the structural strength of the walls, any wall must be capable of safely sustaining any loads to which it is likely to be subjected to and in case of any structural wall, such wall must be capable for safely transferring such loads to the foundations supporting such a wall. Waterproofing cannot be over-emphasized and there must be one hundred percent (100%) waterproofing and therefore a wall must be constructed in such a way that it can resist any penetration of water into any part of the building as it will be detrimental to the health of the occupants or to the durability of the building. It is also important that were any roof truss, rafter or beam is supported by any wall, provision must be made to fix such roof truss, rafter or beam in a secure manner that will ensure that any forces to which the roof may normally be subjected, will be transmitted to such wall.

The following minimum inspection must be conducted and confirmed as it pertains to wall plate/s:

8.5. Placement of Damp-Proof Course (DPC)

The following minimum inspection must be conducted and confirmed as it pertains to the placement of the Damp-Proof Course:

- 8.5.1. the Damp-Proof Course in masonry walls must have been installed at the top level of a concrete floor slab resting on the ground;
- 8.5.2. no Damp-Proof Course must have been installed less than 150 mm above the level of the adjacent finished ground;

8.5.3. transverse joints in the Damp-Proof Course overlapped to a minimum distance equal to the full thickness of the wall or the leaf;

8.5.4. the Damp-Proof Course was laid to the full thickness of the wall and lapped at least 150 mm at all joints in the running length; and

8.5.5. Damp-proof Courses were placed under windowsills.

8.6. Vertical plumb of the wall

8.6.1. Using a level, confirm the vertical plumb of the wall.

8.7. Corner angles

8.7.1. All the corner angles must be exactly 90 degrees.

8.8. Masonry walls

8.8.1. All masonry walls were laid at the centre of strip footings.

8.9. Permissible dimensions and wall thickness

8.9.1. Confirm the permissible dimensions of masonry walls as the following minimum:

Nominal thickness	Use of wall in the building	Max storey height (m)	Max height, ground floor to top of external	Max un-supported length (m)	Min nominal unit strength (MPa)		Min class of mortar
					Solid	Hollow	

			gable (m)				
110	Non- structural Internal wall	3.3	N/A	7.0	7.0	3.5	III
140	Non- structural Internal wall	3.0	N/A	7.0	7.0	3.5	III
140	Structural single storey	3.3.	5.0	6.0	7.0	3.5	II

8.9.2. Confirm wall thickness of which must be the following minimum thickness:

Type of foundation wall		Minimum thickness of wall (mm)						
		Acting as a retaining wall *Difference in ground level (mm)			Not acting as a retaining wall, height (mm)			
		>500	500- 750	750- 1000	>300	300- 500	500- 1000	1000- 1500
Single leaf brick	External	140	190	230	140	140	140	190
	Internal	-	190	230	90	140	140	190
Single leaf hollow block (cavities filled with concrete)	External	140	190	230	140	140	140	190
	Internal	140	190	230	90	140	140	190

8.10. Brick force placement

8.10.1. The placement of the brick force must be in compliance with the project specifications by confirming that brick force comprises of hard drawn wires comprising of two main diameter wires not less than 2.8 mm spaced a constant distance apart and 2.5 mm diameter cross wires spaced at longitudinal intervals of 300 mm in ladder type brick force and at twice the distance between the longitudinal wires in truss type reinforcement.

8.11. Reinforcement of openings

8.11.1. All openings must have reinforced concrete lintels or have precast prestressed concrete or that precast concrete lintels were placed.

8.12. Bagging

8.12.1. All external walls must have been bagged whereby cement slurry was applied (i.e. 1 part of cement to 3 parts of sand) and whereby the wall was rubbed on the wall surface with wet rough sacking or brush until all the joints and crevices were filled up.

8.13. Material requirements

8.13.1. Confirm that masonry units and mortar used in the construction of walling complies with the requirements for compressive strength as follows as a minimum:

Wall type	Position	Minimum average compressive strength (MPa)		Class of mortar required
		Solid units	Hollow units	
Structural other than foundation and retaining walls	Single storey building (external or internal)	7.0	3.5	II
Non-structural other than Parapet, balustrade, and free-standing walls	Internal	7.0	3.5	II
	External	7.0	3.5	III
Free standing	Internal or external	10.5	7.0	III
Foundation	Supporting single storey	7.0	3.5	II
Retaining	-	10.5	7.0	II

8.13.2. Confirm the correct mix proportions for the classes or mortar as the following minimum:

Mortar Class	Portland Cement (kg)	Lime* (l)	Sand (l, max)
II	50 (1 bag)	0.40	200 (3 standard 65 litre barrows)
III	50 (1 bag)	0.80	300 (4.5 standard 65 litre barrows)

* The addition of lime to the mix is optional. A maximum of 40 litre is permitted.

8.13.3. Confirm the mix proportions for cement plasters as the following minimum:

Common cement: External plaster		
50 kg cement (1 bag)	0 – 40 litres lime	150 litres sand (2 standard barrows)
Common cement: Internal plaster		
50 kg cement (1 bag)	0 – 40 litres lime	150 litres sand (2 standard barrows)
Masonry cement: External plaster		
50 kg cement (1 bag)	0 – 40 litres lime	120 litres sand (1.5 standard barrows)
Masonry cement: Internal plaster		
50 kg cement (1 bag)	0 – 40 litres lime	150 litres sand (2 standard barrows)

8.13.4. Confirm that there was no usage of half or broken bricks in the construction of the wall plates.

8.14. Positioning of roof anchors

8.14.1. All the roof anchors must have been positioned correctly and the depth of anchors that are embedded of which must not be less than 600 mm and the roof anchors must be positioned at evenly spaced centres wherever roof structure members are to be located.

8.15. Door and window frames and window glass

8.15.1. Door and window frames must have been set in position, securely braced and strutted and built in as the work proceeds – not only on completion of the entire structure; and

8.15.2. Confirm the square in the corners of the frames and the vertical plumbs in both the directions at the moment of setting, as well as the right fixing of such frames

to the wall and the correct placement taking into account the direction towards the door will be opened.

8.15.3. The size for the front (north-street) elevation windows of the houses must have frames NC4S X 2, each measuring 1511 X 1245 mm; and the windows at the rear (south/back) elevation of the dwellings must be frames NC4 X 2, each measuring 1511 mm × wide and 1245 mm high; and the bathroom window shall be window type NE1: 533 X 654 mm X 1 Low E opaque safety glass.

8.15.4. All window panes must comprise Low E clear glass.

SECTION 3: ROOF

It is important to highlight that the roof of every housing structure must be constructed in such a way that it will resist any forces to which it is likely to be subjected to, be durable and waterproof, not allow any accumulation of any rainwater upon its surface, have a poly vinyl chloride (PVC) underlay, have storm clips and be of a minimum height of all habitable rooms of at least 2,4 m.

8.16. Slope of the roof

8.16.1. Confirm the roof as the following minimum:

8.16.1.1. for metal and fibre-cement, it must be not less than 15 degrees and not more than 30 degrees; and

8.16.1.2. for clay tiles, it must be not less than 17 degrees and not more than 35 degrees.

8.17. Truss, rafter and purlin/batten spacing

- 8.17.1. Confirm that truss, rafter and purlin/batten spacing for different roof coverings are in accordance with manufacturers instruction/certificate or as directed by a Competent Person, of which should be as the following minimum:

Roof cover	Approximate mass (kg/m ²)	Truss spacing (mm; max)	Purlin/Batten spacing (mm; max)		Size of purlin or batten (mm)	
Concrete and clay tiles	65	650	250	Batten	38 X 38	Batten
	55	760	345	Batten	38 X 38	Batten
	55	900	345	Batten	38 X 50 on flat	Batten
	55	1000	345	Batten	38 X 50 on edge	Batten
Profiled metal sheets	11	1500	1200	Purlin	50 X 76 on edge	Purlin
Profiled fibre-cement sheets	15	1200	1200	Purlin	50 X 76 on edge	Purlin

- 8.17.2. Confirm that all trusses, rafters and purlin beams are supported on wall plates on a minimum size of 38 X 76 mm or similar flat bearing surfaces, which are leveled and positioned so as to ensure that the ends of such members are vertically aligned;
- 8.17.3. Confirm the minimum end bearing of 70 mm for mono-pitched or truncated trusses;
- 8.17.4. Confirm that all rafters and roof trusses were tied down to the supporting walls by means of galvanized steel straps or galvanized steel wires, which were built into the walls;
- 8.17.5. Confirm that all trusses were constructed straight and are vertically plumb, i.e. trusses must not be allowed to lean over sideways as it will weaken the truss;

- 8.17.6. Confirm that rafters and purlin rafter/beams were constructed straight and plumb at the required pitch;
- 8.17.7. Confirm before the construction of roof trusses that the area to receive the roof trusses that the wall plates are level and that the holding down wires or hoop-irons have been built into the supported structure at the correct centres and that the constructed trusses are lined up, leveled, plumbed and straightened before the permanent installation of rafter bracing; and
- 8.17.8. Confirm that battens and purlins are continuous (i.e. two rafter spacing) over at least three rafters and that it is fixed to every rafter it crosses.

8.18. Fixing of roof tiles and sheeting

- 8.18.1. Confirm that the specifications of the materials are compliant with a minimum of:
 - 18.1.1. clay and concrete roof tiles may be of the plain or interlocking type and must be true to pattern and uniform in shape;
 - 18.1.2. each tile must be provided with either a continuous batten lug or two batten lugs each of at least 20 mm in length and the thickness of the lugs must not be less than 13 mm; and
 - 18.1.3. roof tiles and sheeting must be free of any cracks, lumps, distortions and other defects.
- 8.18.2. Before commencement of the fixing of roofing materials, it is important to confirm that:

8.18.2.1. roof trusses are to a true line and braced;

8.18.2.2. roof structure is to an acceptable squareness and the pitch is as specified in the project;

8.18.2.3. battens and purlins are of the correct size and have been correctly spaced and fixed to rafters; and

8.18.2.4. masonry walls have been trimmed to receive the roofing material.

8.18.3. For the installation of clay and concrete tiles, confirm as a minimum that all started, finishes and full tiles at the end of each course at a gable end are mechanically fixed by means of clips, nails and or screws; and

8.18.4. For the installation of fibre-cement sheets, confirm that when they are fixed, there must be a full bearing on purlins and their ends must not extend less than 75 mm beyond the point of fixing.

SECTION 4: COMPLETION

8.19.1. Inspection for completion must be conducted;

8.19.2. A completion certificate by the Engineer must be issued that the house is complete and complies with the specifications as approved;

8.19.3. The respective Local Municipality's Building Inspection/Engineer must co-sign the completion certificate.

8.19.4. The beneficiary must sign a happy letter as part of the completion process; and

8.19.5. A snag list is compiled during final inspection and these items does not make the house inhabitable and are minor in nature that does not affect safety and protection against the elements; such snag items must be fixed within the shortest agreed period, and the Inspector must inspect and pass these snag items accordingly.

SECTION 5: POST OCCUPANCY

8.20.1. A random sample of completed inspection stages shall be audited by the Monitoring and Evaluation unit based in the Human Settlements Planning division on a quarterly basis for verification.

9. EFFECTIVE DATE OF THE GUIDELINE


This Guideline shall come into effect from the date of approval.

10. GUIDELINE REVIEW

This Guideline will be reviewed as and when changes are made in national legislation pertaining to house and site inspections.

11. APPROVAL

Policy Developer:

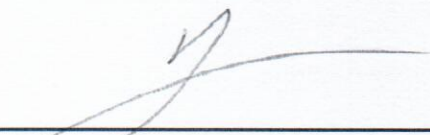


MS HH DU PLESSIS

DIRECTOR: HOUSING POLICY AND RESEARCH

30/7/2020
DATE

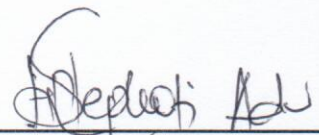
Recommendation:



MR T-PHETLHU
CHIEF DIRECTOR: HOUSING NEEDS,
RESEARCH, PLANNING AND
TECHNICAL SERVICES

30/07/2020
DATE


AND



ADVOCATE N SEPHOTI
HEAD OF DEPARTMENT

30/07/2020
DATE

Approval:



MEC B MOILOA

07/09/2020
DATE

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